Air Products, Santa Clara

1375 Norman Avenue

CalARP Regulated

Approximately 0.45 mile from site

10/13 RMP & Haz Mat Inventory from 10/13 HMBP

(Based on RMP modeling, site is located within the 3.8-mile radius of impact for a worst case release of hydrogen selenide; the site is not located within the radii of impact for the alternative case releases)

AIR PRODUCTS

California Accidental Release Prevention (CalARP) Program

Risk Management Plan

Air Products, Santa Clara, CA

Electronics Specialty Materials Distribution Center

- Ammonia
- Arsine
- Hydrogen Chloride
- Hydrogen Selenide
- Phosphine
- Phosphorus Oxychloride
- Titanium Tetrachloride

Prepared By:

Air Products and Chemicals, Inc.
7201 Hamilton Blvd.
Allentown, PA 18195

October 2013

CalARP Risk Management Plan
Air Products and Chemicals, Inc.
Santa Clara, Ca

1. EXECUTIVE SUMMARY

1.1 Accidental release prevention and emergency response policies:

At this facility, we store the following products (regulated substances).

- Ammonia
- Arsine
- Hydrogen Chloride
- Hydrogen Selenide
- Phosphine
- Phosphorus Oxychloride
- Titanium Tetrachloride

These products are considered hazardous under the CalARP regulation. It is our policy to adhere to all applicable federal and state rules and regulations. Air Products manages the safety of the regulated processes by means of operating procedures, equipment testing and inspections, safety devices (e.g., alarms, shutdowns, instrumentation, relief devices) inherent in the design of this facility and other controls and systems designed to prevent accidental releases of hazardous chemicals. Safe work practices and training of our personnel supplement the inherent safe design of the facility.

Our emergency response program is based upon OSHA's HAZWOPER regulation. The emergency response plan includes procedures for the notification of the local fire authority and Hazardous Materials unit so that appropriate measures can be taken by local emergency responders to control accidental releases. Employees will follow the site emergency response plan to evacuate to the designated gathering point, control traffic into the affect area until responders arrive and to execute the emergency communication plan. The site team will provide assistance such as MSDS information, inventory, details on the incident as known at the time of evacuation, account for all people on site at the time of evacuation. The site team will provide contact for our regional Emergency Response Team and other experts that can be made available to assist the fire department response team as requested.

This document has been prepared in accordance with the California CalARP regulation (Title 19, Chapter 4.5). The substances and processes considered during the preparation of this RMP and the scenarios described were selected based on criteria established in the regulation.

1.2 The stationary source and regulated substances handled:

The primary purpose of this facility is the storage and the redelivery of a variety of compressed gases and chemicals to the end user. The regulated substances are primarily used by Air Products' customers in the manufacture of electronic components. The regulated substances are delivered to this facility in portable, DOT approved, shipping and storage containers. They are stored here until needed by the final user, at which time they are inspected prior to shipment and loaded onto a transport vehicle and delivered to the final user location. There is no chemical reaction involved, and neither is there any transfer of product from one container to another. The regulated process is strictly the storage of the listed regulated substances in the containers in which they were received, until they undergo a pre-shipment quality assurance inspection and are loaded onto a delivery vehicle to be transported to the end user.

The following table lists each regulated substance currently managed at our Santa Clara facility in amounts that exceed either the CalARP threshold, the USEPA RMP threshold amount and/or the OSHA PSM threshold. Though the CalARP and USEPA RMP programs are similar in content, differences in the threshold amounts and the manner in which these amounts are calculated have led to coverage by one or both of these programs. For completeness, we have included all products that qualify for either program in this document. The table lists each regulated substance, it's maximum container size, the maximum total on-site inventory, and which program(s) it qualifies for.

Product Stored	Largest Container (lbs)	Total Quantity (lbs)	CalARP Threshold (lbs)	PSM Process	Program Level
Ammonia	500	15000	500	Y	3
Arsine	50	7600	100	Y	3
Hydrogen Chloride	600	8000	500	Y	3
Hydrogen Selenide	100	8600	10	Y	3
Phosphine	30	5535	500	Y	3
Phosphorus Oxychloride	57.2	1440	500	Y	3
Titanium Tetrachloride	375	15,710	100	N	2

Container sizes listed are the maximum sized container. Some products also come in smaller containers. The total quantity reflects a total of all sized cylinders for each product.

The 1375 Norman Avenue, Santa Clara facility began operation in June of 2001. The original CalARP submission was made in March of 2001 with periodic updates as required. As a result of increases in the variety and quantity of products stored, the facility became subject to the federal RMP program in June of 2004. An updated plan, using the new RMP*Submit program was submitted to both the USEPA and the Santa Clara Fire Department. This submission of May 2005 is in response to the Departments letter date 18 March 2005. This plan incorporates a newly covered product, Titanium Tetrachloride and Phosphorus Oxychloride added in 2008. Two chemicals, Chlorine and Boron Trichloride, have fallen below the CalARP RMP thresholds.

1.3 The worst-case release scenario(s) and the alternative release scenario(s), including administrative controls and mitigation measures to limit the distance for each reported scenario:

Air Products employs a number of administrative controls to limit the potential and magnitude of releases. Foremost has been the decision to limit all activity for the regulated substances to storage only. There will be no transfer of any of the regulated substances at the site. Further, Air Products segregates toxic gases so as to reduce the potential of incompatible gases coming in contact with one another. Segregation is accomplished through a combination of distance and masonry barriers. Air Products consciously controls the on-site inventory of gases to limit the potential magnitude of a site release. Though these administrative controls will make the facility inherently safer, the actual worst case and alternate case scenarios and resulting endpoint calculations have not been altered as a result of their presence.

Air Products has employed a series of mitigating measures to limit the severity of a potential release. Air Products provides manned coverage during normal business hours and manned response 24 hours a day. The facility is equipped with a toxic gas sensing system, which would alert site personnel to releases. Air Products' personnel are trained and capable of handling all products and containers handled on site and any incidental spills that can be easily contained. For reportable level incidents, the site personnel will evacuate to the gathering point and call the local fire department response team for expert assistance.

There is a trained Regional Air Products emergency response team that can be called in to assist the fire department responders as needed to assist in containing gas cylinders, up to 150 pounds in size, through the use of an Emergency Response Containment Vessel.

Toxic Worst Case Scenario – Hydrogen Selenide

The toxic "worst-case scenario" (WCS), as defined by the CalARP regulation, associated with the catastrophic failure of a one hundred pound Hydrogen Selenide cylinder. The entire inventory of 100 pounds is assumed to be released and to vaporize. The maximum distance to the CalARP defined toxic endpoint of .00066 mg/l for this WCS is 3.8 miles.

Alternate Case Scenario - Ammonia

Y-cylinders are very robust packages that have a stellar safety record in the gas industry. Air Products has been using such DOT-specified containers for over 40 years for hazardous gas transport. Y-cylinders are securely mounted to a frame allowing easy handling using a fork truck of pallet truck device. For ammonia and hydrogen chloride, Y-cylinders are required to have fusible metal rupture discs installed that require both external heat (greater than 165°F) and high internal pressure (greater than 3,000 psig) to burst and release the contents. Y-cylinders containing these type of gases are also required to have a gas-tight seal on the cylinder valve outlet during storage and handling to serve as secondary containment incase of valve cross-seat

leakage. Finally, Y-cylinders are required to have a protective cap on the cylinder valve during storage and handling.

Due to site limitations, the storage of ammonia at the Santa Clara warehouse includes the use of specially designed outdoor racks. This permits stacking the Y-cylinders up to three containers high. The rack is constructed of noncombustible materials, designed for seismic zone 4, and has overhead firewater sprinklers. The heaviest container will weigh about 2,000 lb when full of ammonia (1,200 lb vessel, 300 lb frame, 500 lb of product).

The most credible scenario (alternate case) to cause significant release of product from a Y-cylinder at Santa Clara's warehouse would be for the container to be dropped from storage rack height during handling with a forktruck. This could result in the complete shearing of the vapor withdrawal valve if the impact with the ground were sufficient to destroy the protective cap and valve underneath. The inner throat diameter of the Y-cylinder valve is 11 mm for the maximum release hole size. The Y-cylinder valves also have an internal dip tube pointing upwards into the vapor space of the container. This dip tube is welded onto the inside port of the Y-cylinder withdrawal valve and is expected to remain in-place even if the container were dropped from rack height. Therefore, the alternate case scenario selected for the Y-cylinder rack storage covered process at Santa Clara ESG warehouse is vapor release through an 11 mm diameter hole.

The alternate case scenarios were modeled using RMP*Comp. RMP*Comp (version 1.07) is available on federal EPA's Internet site and was developed by the Hazardous Materials Response and Assessment Division, NOAA and the Chemical Emergency Prevention and Preparedness Office of EPA. The program uses CAMEO and ALOHA dispersion modeling methodologies. It is intended for use by facilities covered by the RMP regulation requiring Offsite Consequence Analysis.

Release Hole Size Calculation:
11 mm diameter hole = 0.433 inch diameter hole

$$\frac{\pi D^2}{4} = \frac{\pi(0.433)^2}{4} = 0.147 in^2 \text{ hole area}$$

Ammonia Y-Cylinder Endpoint Distance:
Vapor pressure = 145.0 psia at 77°F (APCI internal computer program APDIPPR v1.38)

Instantaneous release rate = 17.3 lb/min calculated by RMP*Comp for vapor release (unliquefied container)

$$\frac{Mass}{Rate} = \frac{500 lb}{17.3 \, lb/\min} = 28.9 \min \text{ total release time for full Y-cylinder}$$

RMP*Comp ARS endpoint distance < 0.1 miles for Urban topography

Alternate Case Scenario - Arsine

The most likely alternate case scenario for Arsine has been determined to be an operator removing the cylinder valve protection cap of the 50 pound, removing the valve handle tie-down wire, removing the gastight valve outlet cap and dropping the cylinder so that it impacts the valve handle, opening the valve. Drop tests of the Stainless Steel valves have demonstrated that the 316 stainless valves will not shear and could develop small leakage of <10 cc/min, which is far less than a valve open with a restrictive flow orifice. The actual release rate used in the modeling will be 1.67 liters per minute (0.0166 lbs/min), which is based on the restrictive orifice size. This very conservative approach to the alternate case modeling is made more conservative by the fact that the model assumes a minimum leak rate of 0.1 lbs/min.

The distance to the Arsine toxic end point concentration of 0.0019 mg/l, for the alternate case scenario, was determined to be 0.2 miles.

Alternate Case Scenario - Hydrogen Chloride

The most likely alternate case for Hydrogen Chloride was determined to be the premature actuation of the relief device based on Air Products experience with this type of vessel. Shearing off a cylinder valve may be a possibility but it is considered extremely remote due to the size of the largest cylinder and the handling procedures in place (APCI requires this Y- Cylinders be handled in a protective cradle to prevent damage to the cylinders.). The modeling was done as a gaseous flow through the relief valve at the full flow past the relief valve until the full contents of the vessel are released. It was modeled as a continuous release at 211 lbs/min. It has been Air Products experience that this type of release will be a quick puff type release, which quickly diminishes in flow as the container cools, followed by a slow lingering release until the leak can be stopped.

The distance to the Hydrogen Chloride toxic end point concentration of 0.03 mg/l, for the alternate case scenario, was determined to be 0.3 miles.

Alternate Case Scenario - Hydrogen Selenide

The most likely alternate case for Hydrogen Selenide has been determined to be an operator removing the cylinder valve protection cap, removing the valve handle tie-down wire, removing the gastight valve outlet cap, and dropping the cylinder so that it impacts the valve handle, opening the valve. Drop tests of the Stainless Steel valves have demonstrated that the 316 stainless valves will not shear and could develop small leakage of <10 cc/min (0.00008 lbs/min) that is far less than a valve open with a restrictive flow orifice. The release rate used in the modeling was 0.1 lbs/min (13 liters per minute), which is the minimum release rate calculated by the RMP*Comp model. This is a very conservative approach to the alternate vase modeling.

The distance to the Hydrogen Selenide toxic end point concentration of 0.00066 mg/l, for the alternate case scenario, was determined to be 0.3 miles.

Alternate Case Scenario - Phosphine

The most likely alternate case has been determined to be an operator removing the cylinder valve protection cap, removing the valve handle tie-down wire, removing the gastight valve outlet cap, and dropping the cylinder so that it impacts the valve handle, opening the valve. Drop tests of the Stainless Steel valves have demonstrated that the 316 stainless valves will not shear and could develop small leakage of <10 cc/min, which is far less than a valve open with a restrictive flow orifice. The actual release rate used in the modeling was 0.1 lbs/min (31 liters/min) the minimum allowed with the RMP*Comp program. This is a very conservative approach to the alternate vase modeling.

The distance to the Phosphine toxic end point concentration of 0.0035 mg/l, for the alternate case scenario was determined to be 0.1 miles.

Alternate Case Scenario – Phosphorus Oxychloride

The most likely alternative case to result in a release would be a drum being punctured by a forklift in the process of moving a full pallet of packages. If the internal drum is punctured most of the material will be contained with the package but the worst case picked to model, is a spill of the total contents, 57.2 lbs. The material would have to evaporate to get off site and is considered to be highly unlikely. The distance to the toxic end point of 0.003 mg/l for the alternative worst case scenario was determined to be 0.1 miles

Alternative Case Scenario- Titanium Tetrachloride

The most likely alternative case was determine to be puncture of the internal drum with a forklift or dropping of a container from height in order to release the entire contents of the internal drum, 375 lbs. The material would then have to evaporate to get off site and would be in the .1 mile radius with no population effects. The material is packed inside of a 55 gal drum in an internal drum surrounded by packing material. This is considered highly unlikely. The distance to the toxic end point concentration of 0.2 mg/l, for the alternative worst case scenario was determined to be 0.1 mile. This is extremely conservative as it is lowest number for the RMP*Comp program.

1.4 The general accidental release prevention program and specific prevention steps:

The facility developed prevention program elements based on the Federal EPA's Accidental Release Prevention Plan, the California Accidental Release Prevention Program (CalARP), and OSHA's Process Safety Management (PSM) regulation. This facility was designed and constructed to comply with applicable state and industry codes.

Chemical specific prevention steps begin with the decision that all regulated substances would be on-site for storage only. Further, the maximum cylinder size for Arsine, Hydrogen Selenide and Phosphine, have been limited to reduce the potential magnitude of a release. Products will be segregated by compatible hazards (pyrophorics, toxic hydrides, oxidizers, corrosives, flammables) to reduce the possibility of releases.

1.5 Five-year accident history:

Since the initial operation of this facility in June of 2001, there have been no accidents involving or accidental releases of any of the covered chemicals that resulted in any deaths, injuries, or significant property damage on site, or known off-site deaths, injuries, evacuations, sheltering in place, property damage, or environmental damage.

1.6 The emergency response program:

Employees at the facility will not respond to emergencies beyond initiating emergency response from outside agencies. All facility employees have been trained to OSHA's HAZWOPER, First Responder Awareness Level in order to identify the need for an initiated response. Retraining is conducted annually.

The facility maintains an Emergency Procedure Manual that contains specific procedures for employees to take in the event of an emergency or accidental release. This information also contains the names and numbers of responding outside agencies. Emergency actions and response for both flammable releases and toxic releases have been coordinated with Santa Clara City Fire Department. Periodic drills are held in order to review these activities with the responsible responding units.

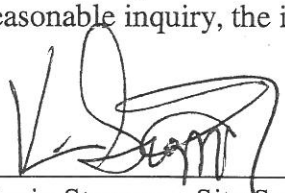
1.7 Planned changes to improve safety:

The facility resolves recommendations from PHAs and Incident Investigations, some of which may result in modifications to the plant design and operating procedures.

The facility has been in operation since 1 June 2001. In 2003 major improvements to the site's security system were installed and are now operational. In 2004 to improve housekeeping and decrease the likelihood of striking a cylinder, the facility installed "Y" rack storage units for ammonia and hydrogen chloride.

Certification:

The undersigned certifies that, to the best of my knowledge, information and belief, formed after reasonable inquiry, the information submitted is true, accurate, and complete.



Kevin Stopper – Site Supervisor

25 NOV 13
Date

d. Street2:

e. City:

f. State: g. ZIP: -

Section 1.17 Process(es)

a. Process ID: 1 Program Level 3 Ammonia Storage

b. NAICS Code

42469 Other Chemical and Allied Products Merchant Wholesalers

c. Process Chemicals

c.1 Process Chemical (ID / Name)	c.2 CAS Nr.	c.3 Qty (lbs.)
1 Ammonia (anhydrous)	7664-41-7	15,000

a. Process ID: 2 Program Level 3 Arsine Storage

b. NAICS Code

42469 Other Chemical and Allied Products Merchant Wholesalers

c. Process Chemicals

c.1 Process Chemical (ID / Name)	c.2 CAS Nr.	c.3 Qty (lbs.)
2 Arsine	7784-42-1	7,600

a. Process ID: 3 Program Level 3 Hydrogen Chloride Storage

b. NAICS Code

42469 Other Chemical and Allied Products Merchant Wholesalers

c. Process Chemicals

c.1 Process Chemical (ID / Name)	c.2 CAS Nr.	c.3 Qty (lbs.)
3 Hydrogen chloride (anhydrous) [Hydrochloric acid]	7647-01-0	8,000

a. Process ID: 4 Program Level 3 Hydrogen Selenide Storage

b. NAICS Code

42469 Other Chemical and Allied Products Merchant Wholesalers

c. Process Chemicals

c.1 Process Chemical (ID / Name)	c.2 CAS Nr.	c.3 Qty (lbs.)
4 Hydrogen selenide	7783-07-5	8,600

a. Process ID: 5 Program Level 3 Phosphine Storage

b. NAICS Code

42469 Other Chemical and Allied Products Merchant Wholesalers

c. Process Chemicals

c.1 Process Chemical (ID / Name)	c.2 CAS Nr.	c.3 Qty (lbs.)
5 Phosphine	7803-51-2	5,535

a. Process ID: 6 Program Level 2 Titanium Tetrachloride

b. NAICS Code

42469 Other Chemical and Allied Products Merchant Wholesalers

c. Process Chemicals

c.1 Process Chemical (ID / Name)	c.2 CAS Nr.	c.3 Qty (lbs.)
6 Titanium tetrachloride [Titanium chloride (TiCl4) (T-4)-]	7550-45-0	15,710

a. Process ID: 7 Program Level 3 Phosphorus Oxy Chloride

b. NAICS Code

42469 Other Chemical and Allied Products Merchant Wholesalers

c. Process Chemicals

c.1 Process Chemical (ID / Name)	c.2 CAS Nr.	c.3 Qty (lbs.)
7 Phosphorus oxychloride [Phosphoryl chloride]	10025-87-3	1,440

Section 2. Toxics: Worst Case

Toxics: Worst Case ID 1

2.1 a. Chemical Name: Hydrogen selenide

b. Percent Weight of Chemical (if in a mixture):

2.2 Physical State: Gas

2.3 Model used: EPA's RMP*Comp(TM)

2.4 Scenario: Gas Release

2.5 Quantity released: 100 lbs

2.6 Release rate: 10.0 lbs/min

2.7 Release duration: 10.0 mins

2.8 Wind speed: 1.5 m/sec

2.9 Atmospheric Stability Class: F

2.10 Topography: Urban

2.11 Distance to Endpoint: 3.80 mi

2.12 Estimated Residential population within distance to endpoint: 206,808

2.13 Public receptors within distance to endpoint:

a. Schools:	Yes	d. Prisons/Correction facilities:	No
b. Residences:	Yes	e. Recreation areas:	Yes
c. Hospitals:	Yes	f. Major commercial, office or, industrial areas:	Yes

g. Other (Specify): San Jose International Airport

2.14 Environmental receptors within distance to endpoint:

a. National or state parks, forests, or monuments:	No
b. Officially designated wildlife sanctuaries, preserves, or refuges:	No
c. Federal wilderness areas:	No

d. Other (Specify):

2.15 Passive mitigation considered:

a. Dikes:	No	d. Drains:	No
b. Enclosures:	No	e. Sumps:	No
c. Berms:	No	f. Other (Specify):	

2.16 Graphic file name:

Section 3. Toxics: Alternative Release

Toxics: Alternative Release ID 1

3.1 a. Chemical Name: Ammonia (anhydrous)

b. Percent Weight of Chemical (if in a mixture):

3.2 Physical State: Gas

3.3 Model: EPA's RMP*Comp(TM)

3.4 Scenario: Rupture disk/Relief Valve failure

3.5 Quantity released: 500 lbs

3.6 Release rate: 118.7 lbs/min

3.7 Release duration: 4.2 mins

3.8 Wind speed: 3.0 m/sec

3.9 Atmospheric Stability Class: D

3.10 Topography: Urban

3.11 Distance to Endpoint: 0.10 mi

3.12 Estimated Residential population within distance to endpoint: 0

3.13 Public receptors within distance to endpoint:

a. Schools:	No	d. Prisons/Correction facilities:	No
b. Residences:	No	e. Recreation areas:	No
c. Hospitals:	No	f. Major commercial, office, or industrial areas:	Yes

g. Other (Specify):

3.14 Environmental receptors within distance to endpoint:

a. National or state parks, forests, or monuments:	No
b. Officially designated wildlife sanctuaries, preserves, or refuges:	No
c. Federal wilderness areas:	No

d. Other (Specify):

3.15 Passive mitigation considered:

a. Dikes:	No	d. Drains:	No
b. Enclosures:	No	e. Sumps:	No
c. Berms:	No	f. Other (Specify):	

3.16 Active mitigation considered:

a. Sprinkler systems:	No	f. Flares:	No
b. Deluge system:	No	g. Scrubbers:	No
c. Water curtain:	No	h. Emergency shutdown systems:	No
d. Neutralization:	No	i. Other (Specify):	
e. Excess flow valve:	No		

3.17 Graphic file name:

Toxics: Alternative Release ID 2

3.1 a. Chemical Name: Arsine

b. Percent Weight of Chemical (if in a mixture):

3.2 Physical State: Gas Liquified by Pressure

3.3 Model: EPA's RMP*Comp(TM)

3.4 Scenario: Vessel valve

3.5 Quantity released: 4 lbs

3.6 Release rate: 0.0 lbs/min

3.7 Release duration: 90.0 mins

3.8 Wind speed: 3.0 m/sec

3.9 Atmospheric Stability Class: D

3.10 Topography: Urban

3.11 Distance to Endpoint: 0.20 mi

3.12 Estimated Residential population within distance to endpoint: 313

3.13 Public receptors within distance to endpoint:

a. Schools:	No	d. Prisons/Correction facilities:	No
b. Residences:	Yes	e. Recreation areas:	No
c. Hospitals:	No	f. Major commercial, office, or industrial areas:	Yes
g. Other (Specify):			

3.14 Environmental receptors within distance to endpoint:

a. National or state parks, forests, or monuments:	No
b. Officially designated wildlife sanctuaries, preserves, or refuges:	No
c. Federal wilderness areas:	No
d. Other (Specify):	

3.15 Passive mitigation considered:

a. Dikes:	No	d. Drains:	No
b. Enclosures:	No	e. Sumps:	No
c. Berms:	No	f. Other (Specify):	

3.16 Active mitigation considered:

a. Sprinkler systems:	No	f. Flares:	No
b. Deluge system:	No	g. Scrubbers:	No
c. Water curtain:	No	h. Emergency shutdown systems:	No
d. Neutralization:	No	i. Other (Specify):	
e. Excess flow valve:	No		

3.17 Graphic file name:

Toxics: Alternative Release ID 3

3.1 a. Chemical Name: Hydrogen chloride (anhydrous) [Hydrochloric acid]

b. Percent Weight of Chemical (if in a mixture):

3.2 Physical State: Gas Liquified by Pressure

3.3 Model: EPA's RMP*Comp(TM)

3.4 Scenario: Rupture disk/Relief Valve failure

3.5 Quantity released: 600 **lbs**

3.6 Release rate: 171.1 **lbs/min**

3.7 Release duration: 3.5 **mins**

3.8 Wind speed: 3.0 **m/sec**

3.9 Atmospheric Stability Class: D

3.10 Topography: Urban

3.11 Distance to Endpoint: 0.30 **mi**

3.12 Estimated Residential population within distance to endpoint: 631

3.13 Public receptors within distance to endpoint:

a. Schools:	No	**d. Prisons/Correction facilities:**	No
b. Residences:	Yes	**e. Recreation areas:**	No
c. Hospitals:	No	**f. Major commercial, office, or industrial areas:**	Yes

g. Other (Specify):

3.14 Environmental receptors within distance to endpoint:

a. National or state parks, forests, or monuments:	No
b. Officially designated wildlife sanctuaries, preserves, or refuges:	No
c. Federal wilderness areas:	No

d. Other (Specify):

3.15 Passive mitigation considered:

a. Dikes:	No	**d. Drains:**	No
b. Enclosures:	No	**e. Sumps:**	No
c. Berms:	No	**f. Other (Specify):**	

3.16 Active mitigation considered:

a. Sprinkler systems:	No	**f. Flares:**	No
b. Deluge system:	No	**g. Scrubbers:**	No
c. Water curtain:	No	**h. Emergency shutdown systems:**	No
d. Neutralization:	No	**i. Other (Specify):**	
e. Excess flow valve:	No		

3.17 Graphic file name:

Toxics: Alternative Release ID 4

3.1 a. Chemical Name: Hydrogen selenide

b. Percent Weight of Chemical (if in a mixture):

3.2 Physical State: Liquid

3.3 Model: EPA's RMP*Comp(TM)

3.4 Scenario: Vessel valve leak - liquid vaporized to a gas

3.5 Quantity released: 3 lbs

3.6 Release rate: 0.0 lbs/min

3.7 Release duration: 90.0 mins

3.8 Wind speed: 3.0 m/sec

3.9 Atmospheric Stability Class: D

3.10 Topography: Urban

3.11 Distance to Endpoint: 0.30 mi

3.12 Estimated Residential population within distance to endpoint: 811

3.13 Public receptors within distance to endpoint:

a. Schools:	No	d. Prisons/Correction facilities:	No
b. Residences:	Yes	e. Recreation areas:	No
c. Hospitals:	No	f. Major commercial, office, or industrial areas:	Yes
g. Other (Specify):			

3.14 Environmental receptors within distance to endpoint:

a. National or state parks, forests, or monuments:	No
b. Officially designated wildlife sanctuaries, preserves, or refuges:	No
c. Federal wilderness areas:	No
d. Other (Specify):	

3.15 Passive mitigation considered:

a. Dikes:	No	d. Drains:	No
b. Enclosures:	No	e. Sumps:	No
c. Berms:	No	f. Other (Specify):	

3.16 Active mitigation considered:

a. Sprinkler systems:	No	f. Flares:	No
b. Deluge system:	No	g. Scrubbers:	No
c. Water curtain:	No	h. Emergency shutdown systems:	No
d. Neutralization:	No	i. Other (Specify):	
e. Excess flow valve:	No		

3.17 Graphic file name:

Toxics: Alternative Release ID 5

3.1 a. Chemical Name: Phosphine

b. Percent Weight of Chemical (if in a mixture):

3.2 Physical State: Gas

3.3 Model: EPA's RMP*Comp(TM)

3.4 Scenario: Vessel valve leak

3.5 Quantity released: 6 lbs

3.6 Release rate: 0.1 lbs/min

3.7 Release duration: 90.0 mins

3.8 Wind speed: 3.0 m/sec

3.9 Atmospheric Stability Class: D

3.10 Topography: Urban

3.11 Distance to Endpoint: 0.10 mi

3.12 Estimated Residential population within distance to endpoint: 0

3.13 Public receptors within distance to endpoint:

a. Schools:	No	d. Prisons/Correction facilities:	No
b. Residences:	No	e. Recreation areas:	No
c. Hospitals:	No	f. Major commercial, office, or industrial areas:	Yes

g. Other (Specify):

3.14 Environmental receptors within distance to endpoint:

a. National or state parks, forests, or monuments:	No
b. Officially designated wildlife sanctuaries, preserves, or refuges:	No
c. Federal wilderness areas:	No

d. Other (Specify):

3.15 Passive mitigation considered:

a. Dikes:	No	d. Drains:	No
b. Enclosures:	No	e. Sumps:	No
c. Berms:	No	f. Other (Specify):	

3.16 Active mitigation considered:

a. Sprinkler systems:	No	f. Flares:	No
b. Deluge system:	No	g. Scrubbers:	No
c. Water curtain:	No	h. Emergency shutdown systems:	No
d. Neutralization:	No	i. Other (Specify):	
e. Excess flow valve:	No		

3.17 Graphic file name:

Toxics: Alternative Release ID 6

3.1 a. Chemical Name: Titanium tetrachloride [Titanium chloride (TiCl4) (T-4)-]

b. Percent Weight of Chemical (if in a mixture):

3.2 Physical State: Gas

3.3 Model: EPA's RMP*Comp(TM)

3.4 Scenario: Vessel leak - drum on its side - 2" bung -liquid evaporation

3.5 Quantity released: 375 **lbs**

3.6 Release rate: 31.8 **lbs/min**

3.7 Release duration: 11.8 **mins**

3.8 Wind speed: 3.0 **m/sec**

3.9 Atmospheric Stability Class: D

3.10 Topography: Urban

3.11 Distance to Endpoint: 0.10 **mi**

3.12 Estimated Residential population within distance to endpoint: 0

3.13 Public receptors within distance to endpoint:

a. Schools:	No	**d. Prisons/Correction facilities:**	No
b. Residences:	No	**e. Recreation areas:**	No
c. Hospitals:	No	**f. Major commercial, office, or industrial areas:**	Yes
g. Other (Specify):			

3.14 Environmental receptors within distance to endpoint:

a. National or state parks, forests, or monuments:	No
b. Officially designated wildlife sanctuaries, preserves, or refuges:	No
c. Federal wilderness areas:	No
d. Other (Specify):	

3.15 Passive mitigation considered:

a. Dikes:	No	**d. Drains:**	No
b. Enclosures:	No	**e. Sumps:**	No
c. Berms:	No	**f. Other (Specify):**	

3.16 Active mitigation considered:

a. Sprinkler systems:	No	**f. Flares:**	No
b. Deluge system:	No	**g. Scrubbers:**	No
c. Water curtain:	No	**h. Emergency shutdown systems:**	No
d. Neutralization:	No	**i. Other (Specify):**	
e. Excess flow valve:	No		

3.17 Graphic file name:

Toxics: Alternative Release ID 7

3.1 a. Chemical Name: Phosphorus oxychloride [Phosphoryl chloride]

b. Percent Weight of Chemical (if in a mixture):

3.2 Physical State: Liquid

3.3 Model: EPA's RMP*Comp(TM)

3.4 Scenario: Vessel Leak - container on its side 3/8" Flarehead fitting liquid evaporation

3.5 Quantity released: 57 lbs

3.6 Release rate: 0.9 lbs/min

3.7 Release duration: 67.2 mins

3.8 Wind speed: 3.0 m/sec

3.9 Atmospheric Stability Class: D

3.10 Topography: Urban

3.11 Distance to Endpoint: 0.10 mi

3.12 Estimated Residential population within distance to endpoint: 0

3.13 Public receptors within distance to endpoint:

a. Schools:	No	d. Prisons/Correction facilities:	No
b. Residences:	No	e. Recreation areas:	No
c. Hospitals:	No	f. Major commercial, office, or industrial areas:	Yes

g. Other (Specify):

3.14 Environmental receptors within distance to endpoint:

a. National or state parks, forests, or monuments:	No
b. Officially designated wildlife sanctuaries, preserves, or refuges:	No
c. Federal wilderness areas:	No

d. Other (Specify):

3.15 Passive mitigation considered:

a. Dikes:	No	d. Drains:	No
b. Enclosures:	No	e. Sumps:	No
c. Berms:	No	f. Other (Specify):	

3.16 Active mitigation considered:

a. Sprinkler systems:	No	f. Flares:	No
b. Deluge system:	No	g. Scrubbers:	No
c. Water curtain:	No	h. Emergency shutdown systems:	No
d. Neutralization:	No	i. Other (Specify):	
e. Excess flow valve:	No		

3.17 Graphic file name:

Cal ARP Risk Management Plan
Air Products and Chemicals, Inc.
Santa Clara, Ca

1.EXECUTIVE SUMMARY

1.1 Accidental release prevention and emergency response policies:

At this facility, we store the following products (regulated substances):
Ammonia
Arsine
Hydrogen Chloride
Hydrogen Selenide
Phosphine
Titanium tetrachloride
Phosphorus Oxychloride

The containers are unloaded from a delivery vehicle for various periods of time, and then are loaded and delivered to the final user. These products are considered hazardous under the Federal RMP regulation. It is our policy to adhere to all applicable federal and state rules and regulations. Air Products manages the safety of the regulated processes by means of operating procedures, equipment testing and inspections, safety devices (e.g., alarms, shutdowns, instrumentation, relief devices) inherent in the design of this facility and other controls and systems designed to prevent accidental releases of hazardous chemicals. Safe work practices and training of our personnel supplement the inherent safe design of the facility.

Our emergency response program is based upon OSHA's HAZWOPER regulation. The emergency response plan includes procedures for evacuation of the site, notification of the local fire authority and Hazardous Materials unit. So that appropriate measures can be taken by the local emergency responders to control accidental releases.

1.2 The stationary source and regulated substances handled:

The primary purpose of this facility is the storage and the redelivery of a variety of compressed gases and chemicals to the end user. The regulated substances are primarily used by Air Products customers in the manufacture of electronic components. The regulated substances are delivered to this facility in portable, DOT approved, shipping and storage containers. They are stored here until needed by the final user, at which time they are inspected prior to shipment and loaded onto a transport vehicle and delivered to the final user location. There is no chemical reaction involved, and neither is there any transfer of product from one container to another. The regulated process is strictly the storage of the listed regulated substances in the containers in which they were received, until they undergo a pre-shipment quality assurance inspection and are loaded onto a delivery vehicle to be transported to the end user.

Following is a listing of each regulated substance currently managed at our Santa Clara facility in amounts that exceed either the USEPA RMP threshold amount. The listing provides each RMP regulated substance, its maximum container, the maximum total on-site inventory, and which program(s) it qualifies for.

Ammonia has a maximum on-site inventory of 15,000 pounds and a maximum single container of 600 pounds. Ammonia at Santa Clara is subject to RMP and PSM.

Arsine has a maximum on-site inventory of 7600 pounds and a maximum single container of 50 pounds. Arsine at Santa Clara is subject to RMP and PSM.

Hydrogen Chloride has a maximum on-site inventory of 8,000 pounds and a maximum single container of 600 pounds. Hydrogen Chloride at Santa Clara is subject to RMP and PSM.

Hydrogen Selenide has maximum on site inventory of 8600 pounds and a maximum single container of 110 pounds. Hydrogen Selenide at Santa Clara is subject to RMP, PSM and CalARP regulations.

Phosphine has a maximum on site inventory of 5535 pounds and maximum container size of 30 lbs. Phosphine at Santa Clara is subject to RMP, PSM and Cal ARP regulations.

Titanium Tetrachloride has a maximum on-site inventory of 15,710 lbs and maximum single container of 375 lbs. Titanium Tetrachloride at Santa Clara is subject to RMP and CalARP regulations.

Phosphorus Oxychloride has a maximum on site inventory of 1140 lbs and maximum container size of 27.2 lbs. Phosphorus Oxychloride is subject to CalARP and PSM regulations.

Containers listed are the maximum d container on site. Some products also come in small containers. The total quantity reflects a total of all stored containers for each product.

A revalidation of the site SVA was completed in 2008 during the PHA update. Action items from the revalidation have been completed.

1.3 The general accidental release prevention program and specific prevention steps:

The facility developed prevention program elements based on the Federal EPA's Accidental Release Prevention Plan, and OSHA's Process Safety Management (PSM) regulation. This facility was designed and constructed to comply with applicable state and industry codes.

Chemical specific prevention steps begin with the decision that all regulated substances would be on-site for storage only. Further, the maximum cylinder for Arsine has been limited to reduce the potential magnitude of a release. Products will be segregated by compatible hazards (pyrophorics, toxic hydrides, oxidizers, corrosives, flammables) to reduce the possibility of releases.

1.4 Five-year accident history:
Since the initial operation of this facility in June of 2001, there have been no accidents involving or accidental releases of any of the covered chemicals that resulted in any deaths, injuries, or significant property damage on site, or known off-site deaths, injuries, evacuations, sheltering in place, property damage, or environmental damage.
1.5 The emergency response program:
All facility employees have been trained to OSHA's HAZWOPER, First Responder Awareness Level in order to identify the need for an initiated response. Retraining is conducted annually. Employees will respond to emergencies by initiating emergency response alarm to outside agencies and evacuate the site.
The site employees are trained to handle small incidental leaks/spills that may occur but will evacuate and account for site personnel for uncontrolled releases. Access to the site will be managed until emergency responders arrive. The site employees will stand by to provide technical support to the responders. In addition, a regional Corporate ER Response Team is available for call out if the responders need hands on assistance.
The facility maintains an Emergency Procedure Manual that contains specific procedures for employees to take in the event of an emergency or accidental release. This information contains the names and numbers of responding outside agencies.
Emergency actions and response for both flammable releases and toxic releases have been coordinated with Santa Clara City Fire Department. Periodic drills are held in order to review these activities with the responsible responding units.
1.6 Planned changes to improve safety:
The facility resolves recommendations from PHAs and Incident Investigations, some of which may result in modifications to the plant design and operating procedures. No additional on-site modifications are currently planned.

RMP Validation Errors/Warnings --- No Data To Report

STATE OF CALIFORNIA

GOVERNOR'S OFFICE OF EMERGENCY SERVICES

CALIFORNIA ACCIDENTAL RELEASE PREVENTION PROGRAM REGISTRATION

OES 2735.6 (NEW 6/97)

Read instructions on reverse before completing.

REGISTRATION TYPE: ☒ NEW ☒ UPDATE

UPDATE TYPE: ADD ☒ DELETE ☒ REVISE

I. Business Owner/Operator Information

BUSINESS NAME
Air Products and Chemicals, Inc.

ADDRESS *(Number and Street)*
1375 Norman Ave.

CITY	COUNTY	STATE	ZIP CODE
Santa Clara	Santa Clara	CA	95054

OWNER/OPERATOR NAME	PHONE NUMBER
Kevin Stopper, Facility Supervisor	(408) 235-8660

II. Regulated Substance List

A.	Name of Each Regulated Substance	Process Max. Quantity (lbs)	CAS#
1.	Ammonia	15000	7664-41-7
2.	Arsine	7600	7784-34-1
3.	Hydrogen Chloride	8000	7647-01-0
4.	Hydrogen Selenide	4200	7783-07-5
5.	Phosphine	5535	7803-51-2
6.	Phosphorus Oxychloride	1440	10025-87-3
7.	Titanium Tetrachloride (New)	15710	7550-45-0

B.	Name of Each Regulated Substance in a Mixture	Percent Weight	Process Max. Quantity (lbs)	CAS#
1.				
2.				

III. Certification

I, the owner or operator of the aforementioned business, hereby certify that the registration information provided above is true, accurate, and complete to the best of my knowledge, based upon reasonable inquiry. I am fully aware that this certification, executed on the date indicated below, is made under penalty of perjury under the laws of the State of California.

OWNER/OPERATOR NAME *(PRINT)*
Kevin Stopper, Site Supervisor

OWNER/OPERATOR SIGNATURE

DATE EXECUTED
25 Nov 13

J BL#066922

California Environmental Reporting System (CERS) — Business Activities

Site Identification

Air Products and Chemicals, Inc. ESG Warehouse
1375 Norman Ave.
Santa Clara, CA, CA 95054
County
Santa Clara

CERS ID
10088797
EPA ID Number

Submittal Status

Submitted on 10/24/2013 by *Kevin Stopper* of Air Products and Chemicals, Inc. (Allentown, Pa)

Hazardous Materials

Does your facility have on site (for any purpose) at any one time, hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or is regulated under more restrictive inventory local reporting requirements (shown below if present); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70?	Yes

Underground Petroleum Storage (UST)

Does your facility own or operate underground storage tanks?	No

Hazardous Waste

Is your facility a Hazardous Waste Generator?	No
Does your facility treat hazardous waste on-site?	No
Is your facility's treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)?	No
Does your facility consolidate hazardous waste generated at a remote site?	No
Does your facility need to report the closure/removal of a tank that was classified as hazardous waste and cleaned on-site?	No
Does your facility generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste.	No
Is your facility a Household Hazardous Waste (HHW) Collection site?	No

Excluded and/or Exempted Materials

Does your facility recycle more than 100 kg/month of excluded or exempted recyclable materials (per HSC 25143.2)?	No
Does your facility own or operate ASTs above these thresholds? Store greater than 1,320 gallons of petroleum products (new or used) in aboveground tanks or containers.	No
Does your facility have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release prevention Program (CalARP)?	Yes

Additional Information

No additional comments provided.

California Environmental Reporting System (CERS) — Business Owner Operator

Facility/Site

Air Products and Chemicals, Inc. ESG Warehouse
1375 Norman Ave.
Santa Clara, CA, CA 95054

CERS ID
10088797

Submittal Status

Submitted on 10/24/2013 by *Kevin Stopper* of Air Products and Chemicals, Inc. (Allentown, Pa)

Identification

Air Products and Chemicals, Inc.

Operator Phone	Business Phone	Business Fax	Beginning Date	Ending Date	
(408) 235-8660	(408) 235-8660	(408) 235-8707			
Dun & Bradstreet	**SIC Code**	**Primary NAICS**			
003001070	5169				

Facility/Site Mailing Address

1375 Norman Avenue
Santa Clara, CA 95054

Primary Emergency Contact

Kevin W. Stopper
Title
Plant Supervisor

Business Phone	24-Hour Phone	Pager Number
4082358660X104	(800) 523-9374	(408) 639-9026

Owner

Air Products and Chemicals, Inc.
(610) 481-4911
7201 Hamilton Bl;vd
Allentown, PA 18195

Secondary Emergency Contact

Luke Charpentier
Title
Asst. Site Manager

Business Phone	24-Hour Phone	Pager Number
4089886263x10	(800) 523-9374	(408) 639-8358

Billing Contact

Kevin Stopper
(408) 235-8660
1375 Norman Ave.
Santa Clara, CA, CA 95054

Environmental Contact

Scot Govert
7077487595x11 govertsc@airproducts.com
555 1St St. Ste 302
Benicia, CA 94510

Name of Signer	Signer Title	Document Preparer
Kevin W. Stopper	Operations Supervisor	Kevin W. Stopper

Additional Information

Locally-collected Fields

Some or all of the following fields may be required by your local regulator(s).

Property Owner

Phone

Mailing Address

Assessor Parcel Number (APN)

Number of Employees
7

Facility ID

Non-Waste Hazardous Materials Inventory Matrix Report

CERS Business/Org. **Air Products and Chemicals, Inc.**
Facility Name **Air Products and Chemicals, Inc. ESG Warehouse**
1375 Norman Ave., Santa Clara, CA 95054

Chemical Location **Outside Covered Canopy**

CERS ID **10088797**
Facility ID
Status **Submitted** on 10/24/2013 11:03 AM

DOT Code/Fire Haz. Class	Common Name	Unit	Quantities: Max. Daily	Quantities: Largest Cont.	Quantities: Avg. Daily	Annual Waste Amount	Federal Hazard Categories	Hazardous Components (For mixture only): Component Name	% Wt	EHS	CAS No.
DOT: 3 - Flammable and Combustible Liquids Flammable Liquid, Class I-B, Irritant	**1,2-TRANS-DICHLOROETHYLENE** CAS No 156-60-5 Map: D	**Gallons** State Liquid Type Pure	**1,597** Storage Container: Steel Drum, Other Days on Site: 365	**5**	5 Pressue: Ambient Temperature: Ambient	0 Waste Code					
DOT: 2.2 - Nonflammable Gases Corrosive, Flammable Gas, Irritant	**AMMONIA** CAS No 7664-41-7 ✓ EHS Map: J	**Pounds** State Gas Type Pure	**15,000** Storage Container: Cylinder Days on Site: 365	**501**	11,000 Pressue: < Ambient Temperature: Ambient	0 Waste Code 141	- Fire - Pressure Release - Acute Health				
DOT: 2.3 - Toxic Gases Highly Toxic, Flammable Gas	**ARSINE** CAS No 7784-42-1 ✓ EHS Map: C	**Pounds** State Gas Type Pure	**7,600** Storage Container: Cylinder Days on Site: 365	**51**	110 Pressue: < Ambient Temperature: Ambient	0 Waste Code	- Fire - Pressure Release - Acute Health				
DOT: 4.3 - Dangerous When Wet Other	**BIS (TERT-BUTYLAMINO) SILANE - BTBAS** CAS No 186598-40-3 Map: D	**Gallons** State Liquid Type Pure	**43** Storage Container: Other Days on Site: 365	**5**	1 Pressue: Ambient Temperature: Ambient	0 Waste Code	- Fire - Acute Health				
DOT: 8 - Corrosives (Liquids and Solids) Corrosive, Other Health Hazard, Toxic, Water Reactive, Class 2	**BORON TRIBROMIDE** CAS No 10294-33-4 Map: G	**Gallons** State Liquid Type Pure	**14** Storage Container: Can, Box, Glass Bottle or Jug Days on Site: 31	**1**	1 Pressue: Ambient Temperature: Ambient	Waste Code	- Reactive - Acute Health - Chronic health				
DOT: 2.3 - Toxic Gases Corrosive, Water Reactive, Class 1	**BORON TRICHLORIDE** CAS No 10294-34-5 ✓ EHS Map: G	**Pounds** State Gas Type Pure	**499** Storage Container: Cylinder Days on Site: 365	**90**	90 Pressue: < Ambient Temperature: Ambient	0 Waste Code	- Reactive - Pressure Release - Acute Health - Chronic health				
DOT: 2.3 - Toxic Gases Oxidizing Gas, Gaseous, Toxic, Water Reactive, Class 3	**CHLORINE TRIFLUORIDE** CAS No 7790-91-2 Map: M	**Pounds** State Gas Type Pure	**220** Storage Container: Cylinder Days on Site: 365	**44**	44 Pressue: < Ambient Temperature: Ambient	0 Waste Code	- Reactive - Pressure Release				
DOT: 2.3 - Toxic Gases Flammable Gas, Toxic, Corrosive	**DICHLOROSILANE** CAS No 4109-96-0	**Cu. Feet** State Gas Type Pure	**2,432** Storage Container: Cylinder Days on Site: 30	**82**	82 Pressue: < Ambient Temperature: Ambient	Waste Code	- Fire - Pressure Release - Acute Health				

Non-Waste Hazardous Materials Inventory Matrix Report

CERS Business/Org. **Air Products and Chemicals, Inc.**
Facility Name **Air Products and Chemicals, Inc. ESG Warehouse**
1375 Norman Ave., Santa Clara, CA 95054

Chemical Location **Outside Covered Canopy**

CERS ID **10088797**
Facility ID
Status **Submitted** on 10/24/2013 11:03 AM

DOT Code/Fire Haz. Class	Common Name	Unit	Quantities: Max. Daily	Quantities: Largest Cont.	Quantities: Avg. Daily	Annual Waste Amount	Federal Hazard Categories	Hazardous Components (For mixture only): Component Name	% Wt	EHS	CAS No.
DOT: 3 - Flammable and Combustible Liquids Flammable Liquid, Class I-C, Other Health Hazard, Irritant	**ETHYL ORTHOSILICATE** CAS No: 78-10-4 Map: D	**Gallons** State: Liquid Type: Pure	**3,772** Storage Container: Steel Drum, Tote Bin, Other Days on Site: 365	**209**	11 Pressue: Ambient Temperature: Ambient	0 Waste Code:	- Fire - Acute Health				
DOT: 2.3 - Toxic Gases Flammable Gas, Unstable (Reactive), Class 3, Toxic	**Germane** CAS No: 7782-65-2 Grid: G	**Pounds** State: Gas Type: Pure	**10** Storage Container: Cylinder Days on Site: 365	**3**	3 Pressue: Temperature: Ambient	Waste Code:	- Fire - Reactive - Acute Health				
DOT: 2.3 - Toxic Gases Toxic, Flammable Gas	**HEXAFLUOROBUTADIENE (1,3) (C4F6)** CAS No: 685-63-2 Map: B, D	**Pounds** State: Gas Type: Pure	**9,000** Storage Container: Cylinder Days on Site: 365	**90**	5,108 Pressue: < Ambient Temperature: Ambient	0 Waste Code:	- Fire - Pressure Release - Acute Health				
DOT: 3 - Flammable and Combustible Liquids Flammable Liquid, Class I-B	**Hexanes** CAS No: Map: D	**Gallons** State: Liquid Type: Mixture	**6** Storage Container: Other Days on Site: 365	**2**	1 Pressue: Ambient Temperature: Ambient	Waste Code:	- Fire	Methylcyclopentane 3-Methylpentane 2-Methylpentane	10 % 5 % 5 %		96-37-7 96-14-0 107-83-5
DOT: 8 - Corrosives (Liquids and Solids) Corrosive, Water Reactive, Class 1, Toxic, Other Health Hazard	**HYDROFLUORIC ACID** CAS No: 7664-39-3 ✓ EHS Map: H	**Pounds** State: Liquid Type: Pure	**400** Storage Container: Cylinder Days on Site: 365	**50**	302 Pressue: < Ambient Temperature: Ambient	0 Waste Code:					
DOT: 2.1 - Flammable Gases Flammable Gas	**HYDROGEN** CAS No: 1333-74-0 Map: B, D	**Cu. Feet** State: Gas Type: Pure	**9,500** Storage Container: Cylinder Days on Site: 365	**291**	500 Pressue: < Ambient Temperature: Ambient	0 Waste Code:	- Fire - Pressure Release				
DOT: 2.3 - Toxic Gases Corrosive, Other Health Hazard, Water Reactive, Class 2	**HYDROGEN CHLORIDE GAS** CAS No: 7647-01-0 Map: G	**Pounds** State: Gas Type: Pure	**8,000** Storage Container: Cylinder Days on Site: 365	**599**	7,303 Pressue: < Ambient Temperature: Ambient	Waste Code: 141	- Reactive - Acute Health - Chronic health				
DOT: 2.3 - Toxic Gases Highly Toxic, Flammable Gas	**HYDROGEN SELENIDE** CAS No: 7783-07-5 ✓ EHS Map: C	**Pounds** State: Gas Type: Pure	**8,500** Storage Container: Cylinder Days on Site: 365	**110**	770 Pressue: < Ambient Temperature: Ambient	Waste Code:	- Fire - Reactive - Pressure Release - Acute Health - Chronic health				

Non-Waste Hazardous Materials Inventory Matrix Report

CERS Business/Org. **Air Products and Chemicals, Inc.**
Facility Name **Air Products and Chemicals, Inc. ESG Warehouse**
1375 Norman Ave., Santa Clara, CA 95054

Chemical Location **Outside Covered Canopy**

CERS ID **10088797**
Facility ID
Status **Submitted** on 10/24/2013 11:03 AM

DOT Code/Fire Haz. Class	Common Name	Unit	Quantities: Max. Daily	Quantities: Largest Cont.	Quantities: Avg. Daily	Annual Waste Amount	Federal Hazard Categories	Hazardous Components (For mixture only): Component Name	% Wt	EHS	CAS No.
DOT: 4.3 - Dangerous When Wet	**LTO-520** CAS No State: Liquid Type: Pure Storage Container: Other Days on Site: 355 Pressue: Ambient Temperature: Ambient Waste Code	**Gallons**	**107**	**5**	1		- Reactive - Acute Health				
DOT: 2.1 - Flammable Gases Flammable Gas	**Monochlorosilane** CAS No 13465-78-6 Map: 4 Grid: A State: Gas Type: Pure Storage Container: Cylinder Days on Site: 365 Pressue: < Ambient Temperature: Ambient Waste Code	**Pounds**	**5,880**	**49**	17		- Fire				
DOT: 2.3 - Toxic Gases Toxic, Irritant	**OCTAFLUOROCYCLOPENTENE (C5F8)** CAS No 559-40-0 Map: E State: Gas Type: Pure Storage Container: Cylinder Days on Site: 31 Pressue: < Ambient Temperature: Ambient Waste Code	**Pounds**	**264**	**44**	132		- Pressure Release - Acute Health				
DOT: 2.3 - Toxic Gases Highly Toxic, Pyrophoric	**PHOSPHINE** CAS No ✓ EHS 7803-51-2 Map: C State: Gas Type: Pure Storage Container: Cylinder Days on Site: 365 Pressue: < Ambient Temperature: Ambient Waste Code	**Pounds**	**5,535**	**42**	720	0	- Fire - Reactive - Pressure Release - Acute Health - Chronic health				
DOT: 8 - Corrosives (Liquids and Solids) Corrosive, Toxic, Unstable (Reactive), Class 2, Water Reactive, Class 2	**PHOSPHORYL CHLORIDE** CAS No 10025-87-3 Map: L State: Liquid Type: Pure Storage Container: Other Days on Site: 365 Pressue: Ambient Temperature: Ambient Waste Code	**Gallons**	**316**	**3**	1	0	- Reactive - Acute Health - Chronic health				
DOT: 2.1 - Flammable Gases Flammable Gas, Unstable (Reactive), Class 1	**PROPENE** CAS No 115-07-1 Map: B, D State: Gas Type: Pure Storage Container: Cylinder Days on Site: 365 Pressue: < Ambient Temperature: Ambient Waste Code	**Pounds**	**5,477**	**40**	16	0					
DOT: 2.1 - Flammable Gases Pyrophoric	**SILANE** CAS No ✓ EHS 7803-62-5 Map: A State: Gas Type: Pure Storage Container: Cylinder Days on Site: 365 Pressue: < Ambient Temperature: Ambient Waste Code	**Pounds**	**3,088**	**34**	62	0	- Fire - Reactive - Pressure Release - Acute Health				
Toxic, Water Reactive, Class 2	**SILICON TETRAFLUORIDE** CAS No 7783-61-1 Map: H State: Gas Type: Pure Storage Container: Cylinder Days on Site: 365 Pressue: < Ambient Temperature: Ambient Waste Code	**Pounds**	**4,800**	**80**	2,400	0	- Reactive - Pressure Release - Acute Health				

Non-Waste Hazardous Materials Inventory Matrix Report

CERS Business/Org. Air Products and Chemicals, Inc.
Facility Name Air Products and Chemicals, Inc. ESG Warehouse
1375 Norman Ave., Santa Clara, CA 95054

Chemical Location Outside Covered Canopy

CERS ID 10088797
Facility ID
Status Submitted on 10/24/2013 11:03 AM

DOT Code/Fire Haz. Class	Common Name	Unit	Quantities: Max. Daily	Quantities: Largest Cont.	Quantities: Avg. Daily	Annual Waste Amount	Federal Hazard Categories	Hazardous Components (For mixture only): Component Name	% Wt	EHS	CAS No.
DOT: 4.3 - Dangerous When Wet	**TDMAT** CAS No: 3275-24-9 Map: D	Gallons State: Liquid Type: Mixture	10 Storage Container: Other Days on Site: 365	3	1 Pressue: Ambient Temperature: Ambient	0 Waste Code:	- Fire - Reactive - Pressure Release - Acute Health - Chronic health				
DOT: 3 - Flammable and Combustible Liquids	**TEB** CAS No: 150-46-9 Map: D	Gallons State: Liquid Type: Mixture	85 Storage Container: Steel Drum Days on Site: 365	4	1 Pressue: Ambient Temperature: Ambient	0 Waste Code:	- Fire - Acute Health				
DOT: 4.3 - Dangerous When Wet Flammable Liquid, Class I-A, Toxic, Water Reactive, Class 2	**TETRAKIS (ETHYLMETHYLLAMIDO) ZINCONIUM** CAS No: 175923-04-3 Map: D	Pounds State: Liquid Type: Pure	10 Storage Container: Other Days on Site: 365	1	1 Pressue: Ambient Temperature: Ambient	0 Waste Code:					
DOT: 3 - Flammable and Combustible Liquids Flammable Liquid, Class I-A, Unstable (Reactive), Class 2, Pyrophoric, Irritant, Water Reactive, Class 1	**TETRAMETHYL SILANE** CAS No: 75-76-3 Map: D	Pounds State: Liquid Type: Pure	8,350 Storage Container: Steel Drum Days on Site: 365	242	50 Pressue: Ambient Temperature: Ambient	0 Waste Code:					
DOT: 8 - Corrosives (Liquids and Solids) Highly Toxic, Corrosive, Water Reactive, Class 2	**TITANIUM TETRACHLORIDE** CAS No: 7550-45-0 ✓ EHS Map: G	Pounds State: Liquid Type: Pure	15,000 Storage Container: Steel Drum, Can Days on Site: 365	20	464 Pressue: Ambient Temperature: Ambient	Waste Code:	- Reactive - Acute Health				
DOT: 3 - Flammable and Combustible Liquids Flammable Liquid, Class I-B, Water Reactive, Class 1, Irritant	**TRIMETHYLBORATE** CAS No: 121-43-7 Map: D	Gallons State: Liquid Type: Pure	8 Storage Container: Steel Drum, Other Days on Site: 365	1	1 Pressue: Ambient Temperature: Ambient	0 Waste Code:					
DOT: 2.1 - Flammable Gases	**TRIMETHYLSILANE** CAS No: 993-07-7 Map: D	Pounds State: Gas Type: Pure	6,090 Storage Container: Cylinder Days on Site: 365	58	116 Pressue: < Ambient Temperature: Ambient	0 Waste Code:	- Fire - Reactive				

Non-Waste Hazardous Materials Inventory Matrix Report

CERS Business/Org. **Air Products and Chemicals, Inc.**
Facility Name **Air Products and Chemicals, Inc. ESG Warehouse**
1375 Norman Ave., Santa Clara, CA 95054

Chemical Location
Outside Covered Canopy

CERS ID **10088797**
Facility ID
Status **Submitted** on 10/24/2013 11:03 AM

DOT Code/Fire Haz. Class	Common Name	Unit	Quantities			Annual Waste Amount	Federal Hazard Categories	Hazardous Components (For mixture only)		
			Max. Daily	Largest Cont.	Avg. Daily			Component Name	% Wt	EHS CAS No.
DOT: 2.3 - Toxic Gases Corrosive, Toxic, Water Reactive, Class 2	**TUNGSTEN HEXAFLUORIDE** CAS No 7783-82-6 Map: H	**Pounds** State Gas Type Pure	**27,560** Storage Container Cylinder Days on Site: 365	**154**	950 Pressue < Ambient Temperature Ambient	0 Waste Code	- Pressure Release - Acute Health			

Non-Waste Hazardous Materials Inventory Matrix Report

CERS Business/Org. **Air Products and Chemicals, Inc.**
Facility Name **Air Products and Chemicals, Inc. ESG Warehouse**
1375 Norman Ave., Santa Clara, CA 95054

Chemical Location
Outside Covered Canopy

CERS ID **10088797**
Facility ID
Status **Submitted** on 10/24/2013 11:03 AM

DOT Code/Fire Haz. Class	Common Name	Unit	Quantities: Max. Daily	Quantities: Largest Cont.	Quantities: Avg. Daily	Annual Waste Amount	Federal Hazard Categories	Hazardous Components (For mixture only): Component Name	% Wt	EHS	CAS No.
DOT: 2.3 - Toxic Gases	**Carbonyl Sulfide**	**Pounds**	**330**	**55**	110		- Fire				
Flammable Gas, Corrosive, Toxic, Other Health Hazard	CAS No 463-58-1 Map: C	State Gas Type Pure	Storage Container Cylinder Days on Site: 365		Pressue > Ambient Temperature Ambient	Waste Code	- Pressure Release - Acute Health				

Non-Waste Hazardous Materials Inventory Matrix Report

CERS Business/Org. **Air Products and Chemicals, Inc.**
Facility Name **Air Products and Chemicals, Inc. ESG Warehouse**
1375 Norman Ave., Santa Clara, CA 95054

Chemical Location **Outside Covered Canopy & Outside Yard Y Cylinder R**

CERS ID **10088797**
Facility ID
Status **Submitted** on 10/24/2013 11:03 AM

DOT Code/Fire Haz. Class	Common Name	Unit	Quantities: Max. Daily	Quantities: Largest Cont.	Quantities: Avg. Daily	Annual Waste Amount	Federal Hazard Categories	Hazardous Components (For mixture only): Component Name	% Wt	EHS	CAS No.
DOT: 2.2 - Nonflammable Gases	**NITROGEN TRIFLUORIDE**	**Pounds**	**8,000**	**430**	6,031	0	- Fire				
Oxidizing Gas, Gaseous, Irritant, Other Health Hazard	CAS No 7783-54-2 Map: M	State Gas	Storage Container Cylinder		Pressue < Ambient	Waste Code	- Pressure Release - Acute Health				
		Type Pure	Days on Site: 365		Temperature Ambient						

Non-Waste Hazardous Materials Inventory Matrix Report

CERS Business/Org. **Air Products and Chemicals, Inc.**
Facility Name **Air Products and Chemicals, Inc. ESG Warehouse**
1375 Norman Ave., Santa Clara, CA 95054

Chemical Location **Warehouse**

CERS ID **10088797**
Facility ID
Status **Submitted** on 10/24/2013 11:03 AM

DOT Code/Fire Haz. Class	Common Name	Unit	Quantities: Max. Daily	Quantities: Largest Cont.	Quantities: Avg. Daily	Annual Waste Amount	Federal Hazard Categories	Hazardous Components (For mixture only): Component Name	% Wt	EHS	CAS No.
DOT: 2.2 - Nonflammable Gases	**AIR** CAS No 132259-10-0 Map: O	**Cu. Feet** State Gas Type Pure	**9,920** Storage Container Cylinder Days on Site: 365	**310**	3,110 Pressue < Ambient Temperature Ambient	0 Waste Code	- Fire - Reactive - Pressure Release - Acute Health - Chronic health				
DOT: 2.2 - Nonflammable Gases Other	**ARGON COMPRESSED** CAS No 7440-37-1 Map: E, O	**Cu. Feet** State Gas Type Pure	**10,784** Storage Container Cylinder Days on Site: 365	**337**	3,370 Pressue < Ambient Temperature Ambient	0 Waste Code	- Pressure Release - Acute Health				
DOT: 2.2 - Nonflammable Gases	**CARBON TETRAFLUORIDE / CF4** CAS No 75-73-0 Map: O	**Pounds** State Gas Type Pure	**5,000** Storage Container Cylinder Days on Site: 365	**575**	4,357 Pressue < Ambient Temperature Ambient	0 Waste Code	- Fire - Reactive - Pressure Release - Acute Health - Chronic health				
DOT: 2.2 - Nonflammable Gases	**HEXAFLUOROETHANE (H116), COMPRESSED GAS** CAS No 76-16-4 Map: O	**Pounds** State Gas Type Pure	**12,427** Storage Container Cylinder Days on Site: 365	**1,000**	9,427 Pressue < Ambient Temperature Ambient	0 Waste Code	- Pressure Release - Acute Health				
DOT: 3 - Flammable and Combustible Liquids Flammable Liquid, Class I-B, Irritant	**ISOPROPANOL** CAS No 67-63-0 Map: N	**Gallons** State Liquid Type Mixture	**5** Storage Container Glass Bottle or Jug, Plastic Bottle or Jug Days on Site: 365	**1**	4 Pressue Ambient Temperature Ambient	0 Waste Code	- Fire - Acute Health				
DOT: 2.2 - Nonflammable Gases	**NITROGEN** CAS No 7727-37-9 Map: O	**Cu. Feet** State Gas Type Pure	**9,728** Storage Container Cylinder Days on Site: 365	**304**	3,040 Pressue < Ambient Temperature Ambient	0 Waste Code	- Fire - Reactive - Pressure Release - Acute Health - Chronic health				
DOT: 2.2 - Nonflammable Gases Cryogen	**NITROGEN, LIQUID** CAS No 7727-37-9	**Gallons** State Liquid Type Pure	**264** Storage Container Cylinder Days on Site: 365	**61**	132 Pressue Ambient Temperature Cryogenic	0 Waste Code	- Pressure Release - Acute Health				
DOT: 2.2 - Nonflammable Gases Oxidizing Gas, Gaseous, Other Health Hazard	**Nitrous Oxide** CAS No 10024-97-2 Map: Area O	**Pounds** State Gas Type Pure	**15,000** Storage Container Cylinder Days on Site: 365	**70**	10,820 Pressue Ambient Temperature Ambient	Waste Code	- Fire - Pressure Release				

Non-Waste Hazardous Materials Inventory Matrix Report

CERS Business/Org. **Air Products and Chemicals, Inc.**
Facility Name **Air Products and Chemicals, Inc. ESG Warehouse**
1375 Norman Ave., Santa Clara, CA 95054

Chemical Location **Warehouse**

CERS ID **10088797**
Facility ID
Status **Submitted** on 10/24/2013 11:03 AM

DOT Code/Fire Haz. Class	Common Name	Unit	Quantities: Max. Daily	Quantities: Largest Cont.	Quantities: Avg. Daily	Annual Waste Amount	Federal Hazard Categories	Hazardous Components (For mixture only): Component Name	% Wt	EHS	CAS No.
DOT: 2.2 - Nonflammable Gases Other Health Hazard	**TRIFLUOROMETHANE** CAS No 75-46-7 Map: O	**Pounds** State Gas Type Pure	**2,000** Storage Container Cylinder Days on Site: 365	**70**	1,555 Pressue < Ambient Temperature Ambient	0 Waste Code	- Pressure Release - Acute Health - Chronic health				
DOT: 2.2 - Nonflammable Gases	**XENON** CAS No 7440-63-3 Map: O	**Pounds** State Gas Type Pure	**4** Storage Container Cylinder Days on Site: 365	**1**	3 Pressue < Ambient Temperature Ambient	0 Waste Code	- Fire - Reactive - Pressure Release - Acute Health - Chronic health				

Non-Waste Hazardous Materials Inventory Matrix Report

CERS Business/Org. **Air Products and Chemicals, Inc.**
Facility Name **Air Products and Chemicals, Inc. ESG Warehouse**
1375 Norman Ave., Santa Clara, CA 95054

Chemical Location **Yard**

CERS ID **10088797**
Facility ID
Status **Submitted** on 10/24/2013 11:03 AM

DOT Code/Fire Haz. Class	Common Name	Unit	Quantities: Max. Daily	Quantities: Largest Cont.	Quantities: Avg. Daily	Annual Waste Amount	Federal Hazard Categories	Hazardous Components (For mixture only): Component Name	% Wt	EHS	CAS No.
DOT: 2.2 - Nonflammable Gases Other	**ARGON COMPRESSED** CAS No 7440-37-1 Map: P	**Cu. Feet** State Gas Type Pure	**46,348** Storage Container Other Days on Site: 365	**6,833**	25,848 Pressue < Ambient Temperature Cryogenic	0 Waste Code	- Pressure Release - Acute Health				
DOT: 2.2 - Nonflammable Gases	**NITROGEN** CAS No 7727-37-9 Map: P	**Cu. Feet** State Gas Type Pure	**31,348** Storage Container Cylinder Days on Site: 365	**304**	26,484 Pressue < Ambient Temperature Ambient	0 Waste Code	- Fire - Reactive - Pressure Release - Acute Health - Chronic health				